Formation of geometric knowledge and skills of primary school pupils

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Abstract. Article devoted to the problem of the formation of geometric knowledge and skills junior high school students. This article provides students to learn how to measure geometric shapes, determine their proximity to life, and measure the geometrical dimensions of measurements, giving them plenty of space for practical work by studying properties of flat figures, the formation of spatial representations and the application of knowledge gained.

Introduction

Current training program in terms of primary teaching mathematics course geometric context, special attention is paid to new material. In this regard, the relevance of the topic is justified. In a scientific article given different types of tasks for understanding the figures to enhance and refine geometric knowledge. Drawings are shown main elements Mue interprets personality of these figures in surroundings. For this, the product is divided into parts, a broken line, an angle and learning elements and properties of polygons is explained in detail.Concrete examples from math textbooks are analyzed.

The article argues that knowledge of geometric shapes useful for pupils in the analysis forms of environmentally friendly objects. For this reason, kids, classroom walls, windows, holiday and other. Form can be assigned

Article in the end results how valuable offers forward

R - n - roll The author shows that the formation of the initial geometric knowledge and skills of elementary school students will be further assimilation of complex geometric material at high school in the future. Meanwhile

measurement, construction, reduction primary school also has a positive effect on life development of students.

Currently, the subject of mathematics in Azerbaijan taught on the basis of approved curriculum (curriculum). This curriculum provides key learning outcomes through interactions between content and activities to determine what students need to know and what to do.

I-IV classroom math program consists of five lines. One of them is the Geometry content string.

Geometry is the study of one's own properties of spatial and spatial figures through a content line, the formation of spatial imagination, analysis and solution of mathematical problems using geometric properties and geometric methods. In the lower classes, geometry is the recognition of basic geometric shapes (for example, triangles, circles, squares, and cubes) through a row of contents. The following classes, extended and supplemented with the study of the properties of geometric figures and geometric transformations are included in various geometric relationships, learn from more spatial geometry (1, page 9).

At connections with by this familiarity with simple geometric shapes in elementary school, studying the properties of flat figures, measurement lengths perimeters and squares, the construction of geometric shapes and their environment identification, solution of geometric problems.

The first the class of students not give information about Tom broken R. In fact, although it is not specifically mentioned, the concept of a broken line is being prepared. The line of destruction is divided into several parts: the end of the first part - the beginning of the second, the end of the second - the third, and so on. called figure taken These fabrics do not form new fabrics. Students are taught the definition of the following term: Fracture lines are called parties. If we specify a point on the part, this point will divide this part into two parts (two parts). But these pieces do not form a broken line.

It is important that students do not show the broken lines and prepare them for the students themselves. This model can be prepared by removing debris from the trash, or a plasticine roller, or a piece (thin rod) at one or two points. Such illustrations are fully compatible with the concepts that students have on the broken line, and are well supported by the term “gap”.

For students, it is important to show clearly closed fractures. It is necessary to draw closed cracks on paper, to model it with the help of debris or wire. This will greatly help students learn about landfills in the future. Because the polygonal border is a closed polyline.

As a result, I-class students should be able to determine the number of elements constituting the geometric figure, identify and determine the lines of destruction within the geometric and other forms described.

Gradually, students in the class learn to answer the question "show pieces in pictures." Pupils can show three or six pieces.

The practice of drawing broken lines on paper not only helps to shape the shapes, but also helps them understand the properties of these shapes and the relevant terminology, as well as prepare students for future acquaintance with other geometric shapes, including polygons.

Primary school students are currently teaching parallel subjects in front of math in a school with polygons. The appearance and development of geometric imagination shows that most children are familiar with the circle called the circle (able to distinguish it from other forms). From this introduction, the teacher should use the information about the landfills. Cut them into a circle and a polygon

Compare and demonstrate both.

To explain the concept of multi-columns, students should be familiar with geometric shapes: a point, a piece, a broken line. Placing polygons on paper and providing instructions for modeling them. It is advisable to use damaged paper at this time. Let's give an example. Children (the teacher can dictate) launch the following task on the toolbar: “Mark the intersection of two lines. Mark the second point with six checkmarks. From the second point, mark four points down and the third point to the right. Combine all three dots with a cloth. “As a result, all students should receive only one shape (triangular). Having returned the teacher's drawings on the writing board, the triangle with its students will be revised again. This is a closed fracture line. They form the borders of the polygon, so we can draw them with a colored pencil, and then cut the border (along the border line). These frames, which form the boundaries of the polygon, are the sides of the polygon, and the ends of the polygons are called the hinge points of the polygon. The teacher pointed to the figure in the figure that the polygon has three sides, three hills. Note that the number of polygons has so many hills, or vice versa. This is called polygonal triangles. The students are told that the name of the polygon is determined by the number of its hill (side, angle). For example: if a polygon has seven hills, they call it, and so on.

Cluster elements, garbage cans, booklets, points and so on. and also used in all lesson materials and bills. When studying numbers, students will also learn how to build a polygon, gradually adopting the rules of procedure.

Note that primary classes should also teach students to distinguish between polygonal elements and mathematics using mathematics and other subject disciplines: a hole is a point where a student clearly shows each point of a hill (the pointer moves to the corresponding point). The sides of the polygon are fragments, the student shows it across the hill

(moves from one hill to another through the channels of the indicator track).

It is wrong to restrict the activity of polygons only to the imposition of figures. Examples of various forms are, for example, the description of the State Emblem of the Republic of Azerbaijan (83, p. 4), published on the first pages of all textbooks (mathematics, information about life, native language, etc.). with the tutorial need to be taught to build different shapes of polygons. As a result of proper work, students should be able to answer the following questions in the picture.

1) What numbers are shown in the picture?

2) curve, 2 line segments, 3 points, 4 closed curve, 5 circle, 6 - polyline, 7 - rectangle, 8-pentagon, 9-hinged, 10-straight, 11 polyline,

3) How many polygons are there (hill) 7, (8, 9)? How many lines of broken line 6 (11)?

Gradually, students can be trained to perform tasks related to the construction of complex shapes.

Children respond: "In this drawing circle are described rectangle, two triangles and five figures" .Learn students show geometric shapes, familiar and surrounding objects in their parts. important When doing business on the environment according to various Objects that should be linked not only to the shape of the figure (its appearance), but also with a certain number (the number of digits, the number of parts).

In the process of laying pieces and polygons, children become acquainted with “large”, “small” and “equal” relations, starting from the 1st grade. With the help of a simple task system, children can also link their works. For example, students using one of the bookshelves have some parts: top or middle; trying to determine which one is smaller: next or middle. The lengths above and the following parts are equal, so they are equal.

Then, students are assigned to identify and show fragments in a more complex version, such as polygons. Such tasks are performed, and paper strips or rope are used to check the results. Students point the piece on a strip of paper and compare it with another piece.

The second piece is larger than the fourth (this is clearly seen). A bit difficult to compare the first and third parts. Mark the end points of the first piece of paper on the strip and place it on the third piece, and you will see that the first piece is smaller than the third.

It is not recommended to give children of the I degree, who do not have enough experience of comparing parts, to provide information on “equal” and “incompatible” details at the first stage. Children must first gain extensive experience in comparing subjects. Gradually, moving to the upper classes, a comparison of works presented in more complex forms than in other textbooks should be accompanied by work (assignments, assignments). At this time, the comparison of parts made of coarse, roulette, dagger, and so on. It is also advisable to use this.

The underdevelopment of small students is very responsive compared to their size. It is more appropriate to formulate and strengthen the teaching of all disciplines, because it is used in the teaching of all disciplines. Consequently, the methodology that we can interpret can apply to all parallel subjects of primary classes. This approach is due to the fact that the length of the pieces is the first step towards the formation of general ideas about the measurement of geometric quantities, as well as the importance of measuring particles. At the first stage it is necessary to create clear ideas for measuring parts. The study showed that for this purpose it would be more advantageous to use a measuring board for accurate measurement of measurements. Measuring a writing board (or other part) consists of counting steps from its beginning to the end.

The teacher instructs one person to measure the writing board (the highest). The student measures step by step, for example, 5 steps. Then this task is

assigned to another student (the smallest), then another result, seven steps are taken. This work is repeated when measuring the width of the gym, the width or length of the yard area.

The teacher claims that people defined a single unit of measurement in different areas for measuring parts (length of writing board, width and height of the gym, width and length of the yard, length of the line in the article, height of the tree, width of the street, depth of the well, etc.)). Students measure the length of the writing board in turn (under the guidance and guidance of the teacher) and take the same number, for example, "four".

Students understand that when measuring a writing board in meters, everyone will receive only the same number. In other disciplines, other parts can also be measured (for example, classroom, gym, width of crop area, length of materials in the workshop, distance from school, etc.). At this stage of measuring parts the use of other length units must also be taken into account.

The need to include a new unit of measurement arises from the impossibility of measuring the distance between the smallest pieces, for example, pencil length, book length and width, side width, table height, objects described in the Life Information and Native Language textbooks. Another unit of measurement is used to measure the smallest parts of a meter. According to the curriculum and textbook text, I-grade students should learn to better measure dimensions using a line. Students should be informed that every 10 small circles are equal to one centimeter. Briefly written as cm. To start you can specify a strip of paper with a length of 1 cm (the width of the strip is much smaller), a gap of 1 cm and a grid. Students should be informed that each subject is 1 cm long. It is important to note that the marking point is at a distance of one cm from the point of intersection of the line, and then the second point after the second right (left, up or down). Students are shown a scroll bar and are told that the length of the track connecting 2 points (with a large bar) is 1 cm. Children draw a piece of 1 cm in a checkered sheet and in the technology lesson several models of centimeters are made (cardboard or match fracture).

One of the most important stages in the formation of the imagination on the measurement of particles is to use centimeter models in the teaching of other subjects, as well as 1 cm .And esearch has shown that using a centimeter model would be more appropriate to teach students the following types of questions:

Issue. Measure a long piece with a centimeter model. When performing this task, the teacher should follow the following actions of the students: put an end to the centimeter model at one end of the measured part; mark the other end of the centimeter model with a pencil on the piece to be measured; Place one of the ends of the centimeter model on the newly acquired point and get another point apart, pointing to the other end. Then it should be explained that the second point is separated by 2 cm. In the same way, the last point should move, since it coincides with the last part of the track. So the student beret piece length (in centimeters), including divided centimeters on fabric. If no overlap is received, the student will respond: "This piece is more than 4 cm and less than 5 cm."

After obtaining sufficient skills to use the centimeter model to measure the details, you can conduct a test (mathematical review).

The teacher says: “On the left (right) side of the sheet, mark the intersection of two lines. From this point on, mark 9 points on the right (left), and the second point below 3 points. Combine these pads with a cloth. Measure the length of the segment, taken using the centimeter model. ";" Tricolor flag at width and stroke length is described. Draw and color in your book.

Tell me what the colors mean. "

During the implementation of these issues, the teacher should monitor the following possibilities:

1) Draw a straight line through a pencil or pencil or take a line on a booklet;

2) mark a point (one end of the track) on this line and you must consistently separate the point from the point in a certain direction (each time with a pencil)

3) Mark the second end of the pencil with a pencil.

Practice shows that at the first stage such tasks are challenging for students. This is explained by the fact that students still cannot work with a smaller model and a pencil (the muscles of the fingers are not well trained). To do this, it is important to repeat the exercises for a long time and systematically when performing other practical exercises on parallel subjects.

In the next stage of skills assessment of skills formation (see above), problems similar to the above two are solved with the help of a large-scale solution that does not have numbers in the process of teaching technological subjects. On the instructions of the teacher, students mark the scale line on a thick paper strip using a centimeter model.

There are simple, but very important tasks that help to build and develop the initial skills of measuring the details: “Measure the length of the saddled element”. To do this, the student must “read” and read every inch of the pencil to one end of the given piece with the pencil.

If you have the skills to measure tracks on a damaged and smooth sheet, you need to teach children to measure surrounding objects using a centimeter model, and then prepare them on a large scale (without a scale). It can be used as a measuring object such as garbage, notes, garbage, crayfish and other unnecessary items. It is advisable to pay special attention to the problem of measuring the sides of polygons.

For example: “Find any triangular (rectangular) shape in the lessons and measure the length of its sides.

You do not need to rush to use a scale that has a digital scale to measure. Because, as can be seen from the study, students often make mistakes when using such a line. One of the reasons why no one makes a mistake is that the students do not pay attention to the beginning of the straw.

Students put a point at the point where the point is not the starting point of the scar, and make mistakes. After properly weighing the parts, the above measurement approach will help to avoid such errors. If some students find this error, they need to reuse the centimeter model and the paper strip to measure the pieces again.

It is more expedient to use the scale as a unit of measurement (cm) when forming figures using the scale in the classroom, and also using the scratch scale as an illustration, and then as a computational tool for collecting and deleting numbers.

For example: “The part is divided into two parts. Measure the length of each section using a scattered line. Can you find the exact length of the piece without measurement? Check on measure.

Using linear scatter, students combine numbers with this rule. You need to find total: 2 + 4. First, "2" is counted from scales (two centimeters - 2 units correspondence to one). The student points to 4 cm to the right and points to "6". This rule is replaced by a concentration of numbers along the length of the pieces.

Students are convinced that when collecting both figures, you need to move in one direction (from the beginning to the right).

Then the corresponding tasks “Collecting and reading units” (2, p. At this stage it is recommended to create a solution for the student: “Solve 3 + 6 with a bullet”.

Solution: we mark a large collection (6) by reading the number. Then we look forward to a new step 3, until we collect a little (3). Elements 9 are taken on the axis. Meanwhile, 3 + 6 = 9.

This method can also be used in the deduction process. It is much more convenient to look at the collection at the same time. For example, you must exit: 8-5. "8” is on the scroll bar (reduced). Here it is suitable for 8 cm - 8 units. Then the student moves from this point to the left, counting to cm (5 cm). This sequence can be performed by counting in 1 cm or group. Student falls to mark "3". You may ask: "How many units can you withdraw from 5 units after 8 units have been reduced to 2 units, 2 units and 1 unit?" As an example, we consider the method that is provided and other options offered by students.

As you can see, the scales can be used for a long time (length 25 cm in length) with the help of “say the machine” (until the memory of the students is fully developed).

The study showed that acquaintance of students with a new unit of measurement - desimetres - simultaneously with the study of the numbers of the second decade. However, incompatibility was discovered when studying existing textbooks in mathematics for elementary grades. Thus, the first acquaintance of students with the concept of "desimeter" occurs on the topic "Units of length" of mathematics 2 (3, p. 77). The textbook shows that 1m = 100cm; 1 dm = 10 cm; 1 cm = 10 mm. Unfortunately, if the connection between centimeters and millimeters is explained and regular studies of these connections are carried out, the information on desymmetry is turned off and children do not come to the “desimeter” block until the end of the second class. This prevents the use of "desimeters" in time and its application in practice. The study showed the following: recalling the information extracted from the life experience and content of other disciplines, the concept of desimetry can be studied from the second grade for students. To this end, the teacher can explain that the height of the building, the length of the damage, the width of

the street is measured in meters. There is also another unit for measuring smaller parts. It is more than a centimeter and less than a meter, which is called a desimeter. Students are introduced to a shorter letter per dm: 3 dm, 5 dm, 15 dm, and so on.

In a technology lesson, each student prepares a model of a cardboard box or a thick paper tape for drawing and measuring parts. If the teacher first tells the students a meter, this means that one meter is ten decimeters. Students are shown meters (divided into desimeters) and used to measure surrounding objects (decimeters). Students build a model of a piece of paper, lines on a writing board and a length of length in a workshop (in a technology lesson) using a desimeter or meter (divided into desimeters).

From the experience of measuring and assembling parts, the length of the segment, for example, is less than 1 dm, less than 2 dm, if expressed in desimeters, if the pencil length is 12 cm in diameter. Pupils should know that "the length of the pencil is 1 cm, and 2 centimeters. The teacher corrects: "The length of a pencil is 1 inch and 2 centimeters", and it shows its short form of writing: 1 dm 2 cm. The construction of details continues in practice, for example, length 1 m 5 cm, 1 mm 9 cm and so on. at installation details.

The concept of "angle" is used not only in life, but also in geometry in several different ways.

Geometrical figures of class I: they do not speak of angle, because they do not need to know a plane or a ray. Therefore, at the first stage, the concept of "angle" should be used in the context of "surrounded corners of a polygon" based on illustrated images in various textbooks. This approach, in contrast to the previous approach, is very versatile and visually impressive, and also provides scientific outfits for concepts derived from other disciplines, and also forms a polygonal understanding based on the knowledge gained from neighboring subjects.

The information provided to students of grades I-IV should not be exhaustive. It is more expedient for me to demonstrate to students the angles of a triangle and a quadrilateral that are not Willian, in order to prepare an angular model in extracurricular activities or in a classroom technique. In this case, the polygonal sections must be separated so that each of these parts has one loop and two sides of the hill.

It should be noted here that the hexagon is also a hinge. When performing these actions in the educational process, it is more appropriate to acquaint students with corner models made of paper. Children divide paper polygons into sections. Creating pupils with the correct ideas about angles depends on their ability to display correctly. To do this, you need to position the pointer to the top of the corner and turn the pointer on the other side, turning it "in a peculiar way" from the edge of one side.

It is also possible to open the contents using the action: "angle of shrinkage" (small meat), "increase in angle" (larger meat). For this purpose, students can use a model (technically or independently) of a model (two thinner plastic flanges reinforced with plastic).

Students are told that (as models show), the closer we are, the smaller the angle, the bigger the angle, the bigger the angle. It is supported and articulated in the initial concepts and practical lessons learned in connection with the concept of the paradigm.

Explanation of rectangular thoughts should be gradually implemented through the interrelation of mathematical knowledge and skills possessed by children, experimental data that they collect from observations, and illustrated educational materials on parallel subjects. One, two, three and so on. It is more reasonable to begin with consideration of the polygons described in drawings in rectangles and in different textbooks. It is also advisable to use checkered stripes to construct a rectangular polygon in class I. Attention of the student should be directed to several straight lines forming a rectangle. These angles are also used to construct polygons. A. In - First, at a right angle to the conditions in the classroom clay inventory (slabs corners, the corners of the windows, the corners of the table, etc.), and then illustrated as rectangles in various textbooks, etc. is displayed, a flat angle is found, its hinge point and sides are shown. Then a triangle is formed from a right angle: the front of the rectangle is marked, then the sides of the triangle, which form a right angle, and finally the third side.

The search for figures with two right angles of the same work continues, showing its hills and sides. In this case, try to build a triangle with two right angles. Students point to two points (two hills of a triangle) connecting two rectangles, which later realize that the triangle is “not taken” because its lines do not intersect.

Thus, the conclusion is that the triangle is just a right angle.

Then recognition of rectangular lamps with two right angles is performed and the completion of the finding, and finally the installation. When building rectangles with three right angles, students come to the conclusion that the fourth angle will be flat.

Students also verify that all the corners of the bead are straight. Using various real-life examples and illustrations from different textbooks, students get the same conclusion that only four quadrants can be straight. This is called a rectangular rectangle.

Students observe things in the environment.

List the names of the objects in the form: writing board, flooring, window glass, etc. Comparing the rectangles, the children come to the conclusion that the opposite side is in the same equation. This can be checked without measuring. Children know, for example, that the sheets are rectangular. They make sure that all their angles are flat with the help of a dotted triangle. It then shows the flat corners as a result of folding the paper. The bending of the sheet contributes to the overlapping of opposite sides, i. E. Their equality. Here it is indicated that both the angles obtained and the opposite sides are the same, that is, they are equal.

Finally, students can begin to build a set of polygons with long sides. The classroom is easier than ever before, I use the toolbar.

Issue. Draw a rectangle 4 cm long and 2 cm wide.

A student marks a hill of a pointed rectangle at the intersection of two lines of a checkered sheet. Children know that one of the sides of a rectangular hill is its length and the other width. So this is a trick to get two pieces out of this item:

one) Take the right angle between them;

2) The length of one piece is 4 cm, and the other - 2 cm.

With the help of bosses, children build a rectangle (you can do this without using a scratch, because students already know that two teas have one centimeter). The three points obtained are the three points of the hill of the rectangle. Counting the ropes without measurement, the students find the fourth hill. The slides are connected in series (with the hatch) with strokes with colored pencils. Students have a rectangular shape with a length of 4 cm and a width of 2 cm. This work continues at classroom events in various subjects and in the form of various practical exercises.

In the first year of study, geometric figures and objects were used as countable objects. Subsequently, elements such as objects (angles, angles, polygon heights) are used as objects. In the first grade, students become familiar with the measurement of the part, which allows them to interact with parts and parts. Familiarity with the measuring part in them (children) for natural numbers, the decimal number system creates a visual perception of the illustration (see single, dm-hundred, one thousand, one thousand) (6, p. 4).

When considering the role of the teacher in teaching geometry in primary school it becomes clear that the definition of a methodology that reveals the geometric content is one of the important issues. The main objectives of this material are defined (7):

1) the development of spatial thinking;

2) development of reflective skills;

3) environmental awareness with geometric position;

4) the formation of fantasies about flat and spatial figures;

5) Preparing to study the course geometry of high school.

Studies show what geometric skills developed in math class, formed by other means. This kind of related training can be continued in recognition of the variety of subjects of various forms, as well as in learning the signs of figures at in the form of colorful geometric shapes, both in life and in other textbooks. Because these works are used to develop the relevant skills and strengthen the relevant mathematical knowledge.

The formation of the initial geometric knowledge and skills of primary school students will help in the future to master the complex geometric material in high school. At the same time, measurement, construction, reduction of primary classes has a positive effect on the development of life skills of students.

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